

EOS Production Sites

Network Performance Report: December 2011

This is a monthly summary of EOS network performance testing between production sites -- comparing the measured performance against the requirements. **Significant improvements are noted in Green, Network problems in Red, System problems and Requirements issues in Gold, Issues in Orange, and other comments in Blue.**

Highlights:

- **Mostly stable flows**
 - **GPA 3.83** (same as last 3 months)
- **Requirements:** updated to Handbook 1.4.3 in May '09 (was 1.4.2 previously)
 - Many Requirements dropped significantly (under review)
- **Only 2 flows below "Excellent"; only 1 below "Good":**
 - **GSFC MODAPS-PDR to EROS ("Almost Adequate")**
 - Only slightly below "Adequate"

Ratings Changes:

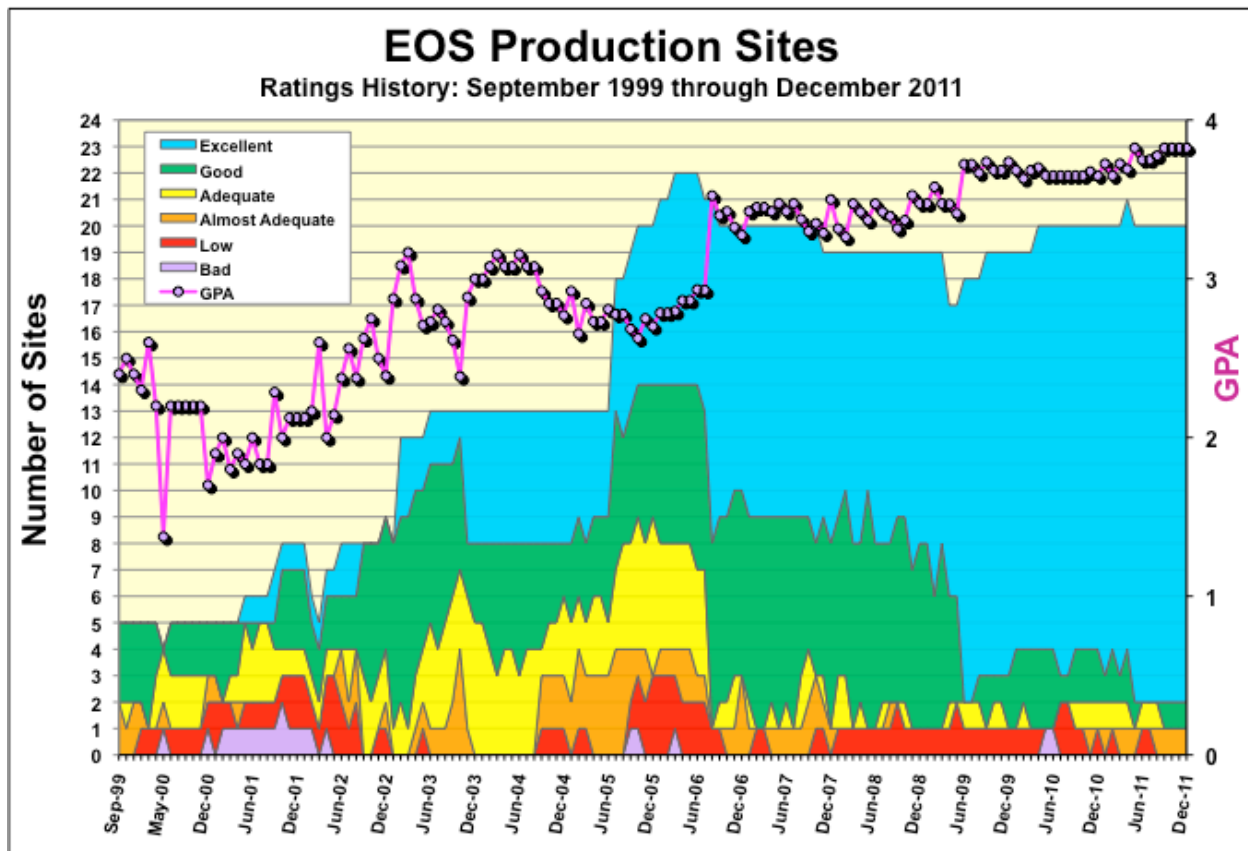
Upgrades: ↑ None

Downgrades: ↓ None

Ratings Categories:

Rating	Value	Criteria
Excellent:	4	Total Kbps > Requirement * 3
Good:	3	1.3 * Requirement <= Total Kbps < Requirement * 3
Adequate:	2	Requirement < Total Kbps < Requirement * 1.3
Almost Adequate:	1.5	Requirement / 1.3 < Total Kbps < Requirement
Low:	1	Requirement / 3 < Total Kbps < Requirement / 1.3
Bad:	0	Total Kbps < Requirement / 3

Where Total Kbps = Average Integrated Kbps (where available), otherwise just iperf

Ratings History:

The chart above shows the number of sites in each rating category since EOS Production Site testing started in September 1999. Note that these ratings do NOT relate to absolute performance – they are relative to the EOS requirements.

Additions and deletions:

2011 April: Added RSS to GHRC
2011 May: Deleted WSC to ASF for ALOS

Requirements Basis:

While the long-term plan is to use the requirements from the EOSDIS network requirements database, the database does not appear ready to be used for that purpose at this time. ESDIS is in process of reviewing its network ICD's with each instrument team. When these ICDs are completed, the database will be updated with the ICD values, and those values will be used here as well.

Until then, the requirements are based on the EOS Networks Requirements Handbook, Version 1.4.3 (from which the original database requirements were derived). Previously, the requirements were derived from version 1.4.2.

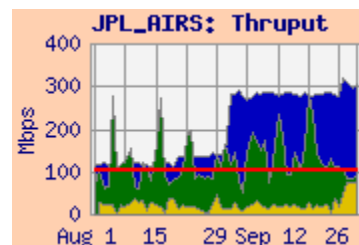
One main difference between Handbooks 1.4.2 and 1.4.3 is that most flows which occur less than once per day were averaged over their production period. These flows were typically monthly Level 3 data transfers, which were specified to be sent in just a few hours. However, they could easily be accommodated either between the per-orbit flows, or within the built-in contingency. Previously, these flows were added in linearly to the requirements, making the requirements unrealistically high.

Additionally, the contingency for reprocessing flows greater than 2X reprocessing was reduced. These flows WERE a major component of the contingency, so adding additional contingency on top of these flows was considered excessive.

However, it seems likely that there are some flows which have been omitted from version 1.4.3. For example, the GES DISC to KNMI requirement for Level 1+ data (without contingency) was 1.4 mbps in version 1.4.2, but only 22 kbps in version 1.4.3. The user flow has been averaging about 1.4 mbps, suggesting that version 1.4.2 was correct, and that version 1.4.3 has omitted something.

Integrated Charts:

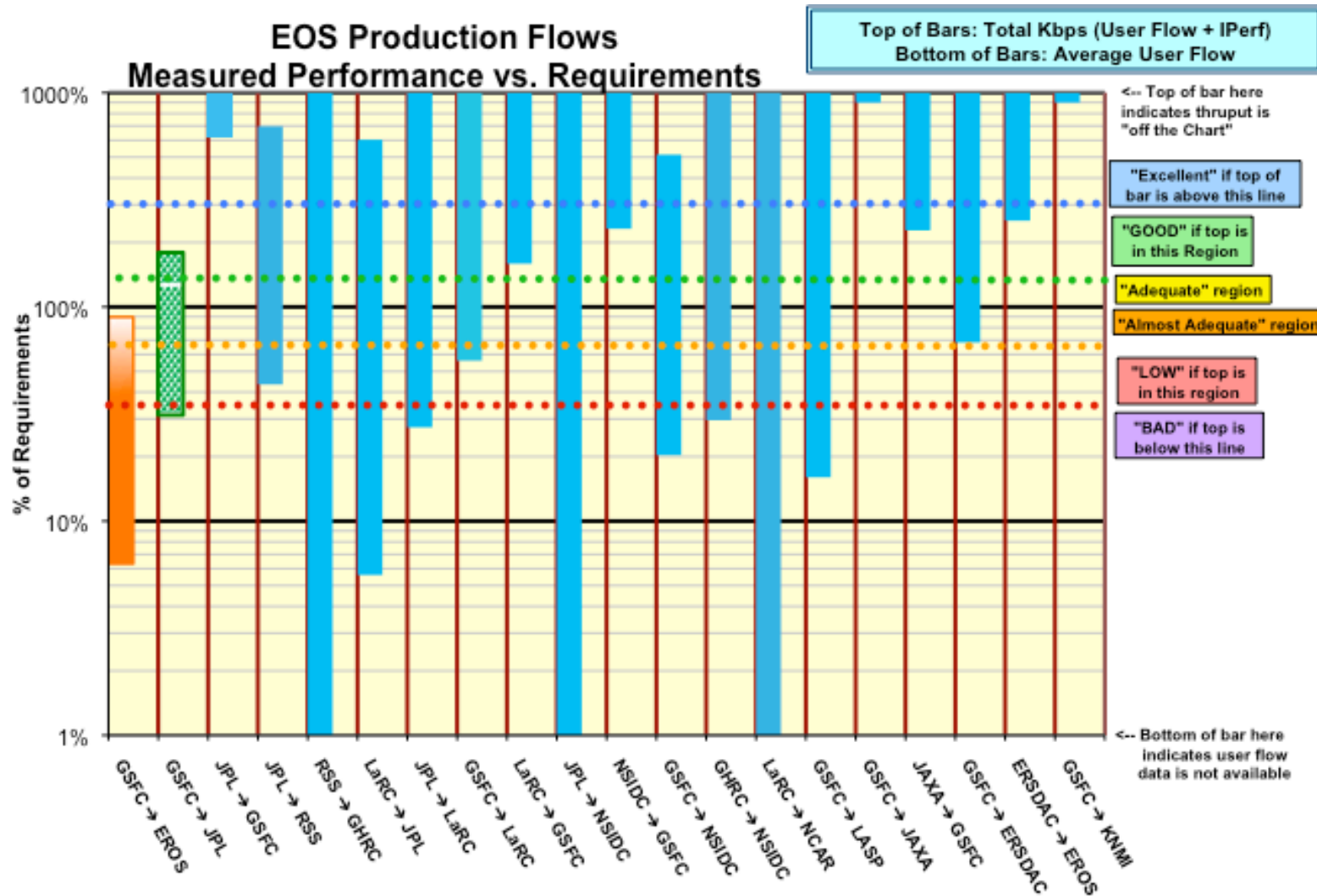
Integrated charts are included with site details, where available. These charts are "Area" charts, with a "salmon" background. A sample Integrated chart is shown here. The yellow area at the bottom represents the daily average of the user flow from the source facility (e.g., GSFC, in this example) to the destination facility (JPL, in this example) obtained from routers via "netflow". The green area is stacked on top of the user flow, and represents the "adjusted" daily average iperf throughput between the source-destination pair most closely corresponding to the requirement. This iperf measurement essentially shows the circuit capacity remaining with the user flows active. Adjustments are made to compensate for various systematic effects, and are best considered as an approximation. The red line is the requirement for the flow from the source to destination facilities. On some charts a blue area is also present – usually "behind" the green area – representing adjusted iperf measurements from a second source node at the same facility.



Network Requirements vs. Measured Performance

December 2011		Requirements (mbps)		Testing				Ratings		
Source → Destination	Instrument (s)	Current	Old	Source → Dest Nodes	Average User Flow mbps	iperf Median mbps	Integrated mbps	Ratings re HB 1.4.3 Requirements		
		HB 1.4.3	HB 1.4.2					This Month	Last Month	
GSFC → EROS	MODIS, LandSat	342.9	345.9	MODAPS-PDR → EROS LPDAAC	21.7	302.0	307.5	AA	AA	
GSFC → JPL	AIRS, MLS, ISTs	101.7	43.6	GES DISC → JPL-AIRS	31.8	180.1	182.4	Good	Good	
JPL → GSFC	MLS	0.6	7.4	JPL-PTH → GSFC-ESDIS-PTH	3.5	85.3	85.5	Excellent	Ex	
JPL → RSS	AMSR-E	0.5	2.5	JPL-PODAAC → RSS	0.21	3.37		Excellent	Ex	
RSS → GHRC	AMSR-E	0.3		RSS (Comcast) → GHRC		3.81		Excellent	Ex	
LaRC → JPL	TES, MISR	69.3	43.7	LARC-ASDC → JPL-TES	3.9	417.4		Excellent	Ex	
JPL → LaRC	TES	1.5	4.4	JPL-PTH → LARC-PTH	0.4	62.7		Excellent	Ex	
GSFC → LaRC	CERES, MISR, MOPITT	31.3	60.5	GES DISC → LaRC ASDC	17.6	550.4	550.4	Excellent	Ex	
LaRC → GSFC	CERES, MODIS, TES	0.4	0.2	LARC-ASDC → GES DISC	0.57	343.7	343.7	Excellent	Ex	
JPL → NSIDC	AMSR-E	0.2	1.3	JPL-PODAAC → NSIDC		227.8		Excellent	Ex	
NSIDC → GSFC	MODIS, ICESAT, QuikScat	0.6	0.5	NSIDC DAAC → GES DISC	1.32	216.5	216.5	Excellent	Ex	
GSFC → NSIDC	MODIS, ICESAT, QuikScat	27.6	34.5	GES DISC → NSIDC-DAAC	5.6	141.8	141.8	Excellent	Ex	
GHRC → NSIDC	AMSR-E	0.5	7.5	GHRC → NSIDC DAAC (ftp)	0.14	12.5		Excellent	Ex	
LaRC → NCAR	MOPITT	0.1	5.4	LARC-ASDC → NCAR		268.6		Excellent	Ex	
GSFC → LASP	ICESat, QuikScat	0.4	0.4	ESDIS-PTH → LASP (blue)	0.064	9.00		Excellent	Ex	
GSFC → JAXA	QuikScat, TRMM, AMSR	0.1	2.0	GSFC → JAXA	2.7	Testing discontinued: 31 March 2009		Excellent	Ex	
JAXA → GSFC	AMSR-E	0.1	1.3	JAXA → GSFC	0.3			Excellent	Ex	
GSFC → ERSDAC	ASTER	5.4	12.5	GSFC-EDOS → ERSDAC	3.7	74.2	75.0	Excellent	Ex	
ERSDAC → EROS	ASTER	8.3	26.8	ERSDAC → EROS PTH	20.9	102.3	105.5	Excellent	Ex	
GSFC → KNMI	OMI	0.03	3.3	GSFC-OMISIPS → KNMI ODPS	3.2	65.5	65.8	Excellent	Ex	
					Significant change from v 1.4.2 (5/09) to v 1.4.3		Ratings Summary			
					Value used for ratings				HB 1.4.3 Req	
								Score	Prev	
*Criteria:	Excellent	Total Kbps > Requirement * 3				Excellent		18	18	
	Good	1.3 * Requirement <= Total Kbps < Requirement * 3				Good		1	1	
	Adequate	Requirement < Total Kbps < Requirement * 1.3				Adequate		0	0	
	Almost Adequate	Requirement / 1.3 < Total Kbps < Requirement				Almost Adequate		1	1	
	Low	Requirement / 3 < Total Kbps < Requirement / 1.3				Low		0	0	
	Bad	Total Kbps < Requirement / 3				Bad		0	0	
							Total Sites		20	20
Notes:	Flow Requirements include: TRMM, Terra, Aqua, Aura, ICESAT, QuikScat, GEOS						GPA		3.83	3.83

This graph shows a bar for each source-destination pair – relating the measurements to the requirements for that pair. The bottom of each bar represents the average measured user flow from the source site to the destination site (as a percent of the requirement) – it indicates the relationship between the requirements and actual flows. Note that the requirements generally include a 50% contingency factor above what was specified by the projects, so a value of 67% (dotted orange line) would indicate that the project is flowing as much data as requested. The top of each bar similarly represents the integrated measurement, combining the user flow with Iperf measurements – this value is used to determine the ratings.



1) EROS:

Ratings: GSFC→ EROS: Continued **Almost Adequate**
 ERSDAC→ EROS: Continued **Excellent**

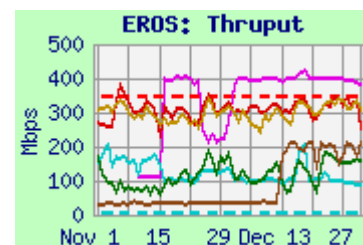
Web Page: <http://ensight.eos.nasa.gov/Organizations/production/EROS.shtml>
http://ensight.eos.nasa.gov/Organizations/production/EROS_PTH.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
MODAPS-PDR → EROS LPDAAC	344.7	302.0	227.9	21.7	307.5
GSFC-EDOS → EROS LPDAAC	245.5	129.0	24.7		
GES DISC → EROS LPDAAC	365.5	315.9	208.7		
GSFC-ENPL → EROS LPDAAC	415.7	399.6	231.7		
ERSDAC → EROS LPDAAC	136.8	102.3	66.7	20.9	105.5
NSIDC SIDADS → EROS PTH	214.1	170.0	30.8		
GSFC-ENPL → EROS PTH	828.5	778.5	647.0		
GSFC-NISN → EROS PTH	384.6	275.0	188.1		
LaRC PTH → EROS PTH	186.3	122.2	62.6		

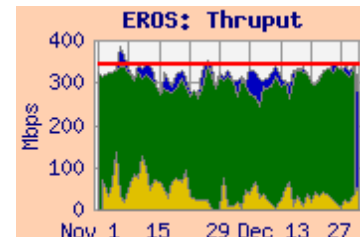
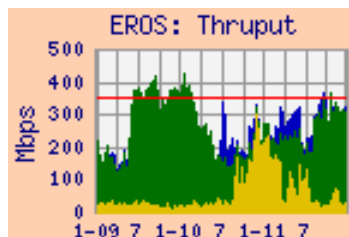
Requirements:

Source → Dest	Date	mbps	Rating
GSFC → EROS	CY '08-11	343	Almost Adequate
ERSDAC → EROS	FY '06 -'10	8.3	Excellent

**Comments:**

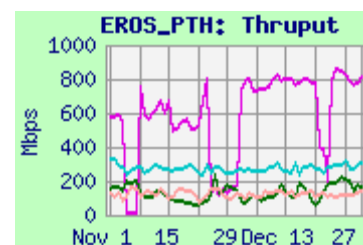
1.1 GSFC → EROS: The rating is based on the MODAPS-PDR Server to EROS LP DAAC measurement, since that is the primary flow. The route is via the Doors to NISN SIP, via the NISN 10 gbps backbone to the NISN Chicago CIEF, then via GigE to the StarLight Gigapop, peering there with the EROS OC-48 tail circuit.

The user flow dropped off mid March '11, after about 5 months of high user flow, reportedly based on a science user at EROS acquiring MODIS data. This month it averaged only about 6% of the nominal requirement (the requirement includes MODIS reprocessing).



The rating from MODAPS-PDR to LPDAAC remains **Almost Adequate**.

Iperf testing from GSFC-ENPL was added to LPDAAC in November, to compare with testing to EROS-PTH from this source. The GSFC-ENPL host has a direct connection to the MAX; its route is via MAX to Internet2 to StarLight in Chicago. GSFC-ENPL to EROS-PTH typically gets almost 800 mbps, and shows the capacity of the network is well in excess of the requirement. Also, GSFC-ENPL to EROS LPDAAC is the best to LPDAAC, and would be rated **Adequate**. The difference in performance from GSFC-ENPL to EROS-PTH vs LPDAAC is attributable to the extra firewalls at EROS. GSFC-ENPL to EROS PTH would be rated **Good**.



1.2 ERSDAC → EROS: **Excellent**. See section 9 (ERSDAC) for further discussion.

1.3 NSIDC → EROS-PTH: Performance improved in mid December – after dropping in mid October – apparently due to switching routes at FRGP.

1.4 LaRC → EROS: The throughput from LaRC-PTH to EROS-PTH was stable. The route is via NISN SIP to the Chicago CIEF to StarLight – similar to EBnet sources.

2) to GSFC

Ratings: NSIDC → GES DISC: Continued **Excellent**
 LDAAC → GES DISC: Continued **Excellent**
 JPL → GSFC: Continued **Excellent**

Web Pages:

<http://ensight.eos.nasa.gov/Organizations/production/GDAAC.shtml>

http://ensight.eos.nasa.gov/Organizations/production/ESDIS_PTH.shtml

http://ensight.eos.nasa.gov/Missions/icesat/GSFC_ISIPS.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow
	Best	Median	Worst	
EROS LPDAAC → GES DISC	206.3	164.6	114.2	
EROS PTH → GSFC-ESDIS PTH	417.9	306.5	196.6	
JPL-PTH → GSFC-ESDIS PTH	88.3	85.3	79.4	3.5
LaRC ASDC → GES DISC	442.4	343.7	204.3	0.57
LARC-ANGe → GSFC-ESDIS PTH	452.3	391.3	340.2	
NSIDC DAAC → GES DISC	288.6	216.5	157.0	1.32
NSIDC DAAC → GSFC-ISIPS	123.1	118.7	87.6	

Requirements:

Source → Dest	Date	Mbps	Rating
NSIDC → GSFC	CY '06 – '10	0.6	Excellent
LaRC ASDC → GES DISC	FY '07 – '10	0.4	Excellent
JPL → GSFC combined	CY '06 – 10	3.2	Excellent

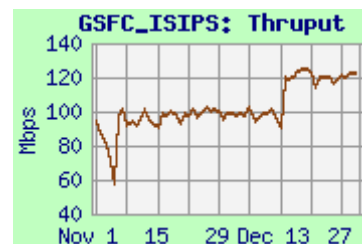
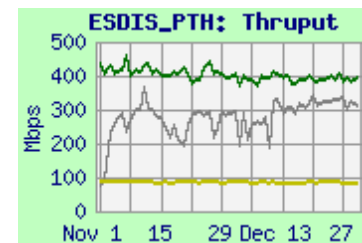
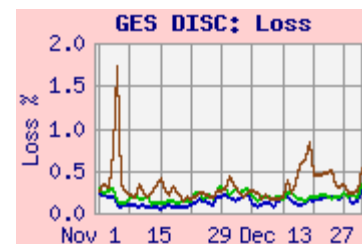
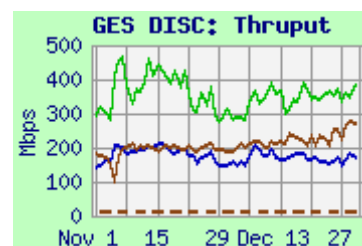
Comments: Thruput to GES DISC was noisy but relatively stable this month, similar to last month.

EROS, EROS-PTH → GSFC: The thruput for tests from EROS and EROS-PTH to GES DISC and ESDIS-PTH were mostly stable, with better results from EROS-PTH.

JPL → GSFC: Thruput from JPL-PTH was again very stable this month. With the modest requirement (reduced from 7.4 mbps in May '09), the rating remains "Excellent". The actual user flow is consistent with the reduced requirement.

LaRC → GSFC: Performance from LaRC ASDC to GES DISC and LaRC ANGe to ESDIS-PTH remained way above 3 x the modest requirement, so the rating continues as "Excellent". The user flow this month was close to the requirement.

NSIDC → GSFC: Performance from NSIDC to GSFC (DAAC and ISIPS) improved in mid December, after dropping in mid October, apparently due to switching routes at FRGP. The user flow was above the low requirement (reduced from 13.3 mbps in May '09); the rating remains "Excellent".

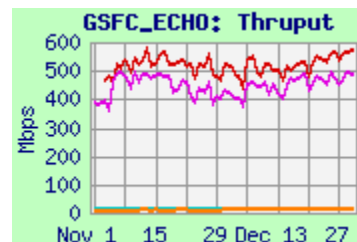


2.2 GSFC-ECHO: EOS Metadata Clearinghouse

Web Page: http://ensight.eos.nasa.gov/Organizations/gsfcs/GSFC_ECHO.shtml

Test Results:

	Medians of daily tests (mbps)		
	Best	Median	Worst
EROS LPDAAC	n/a	n/a	n/a
EROS LPDAAC ftp	11.9	11.9	11.0
GES DISC	586.3	522.5	381.6
GES DISC ftp	522.9	453.3	296.3
LaRC ASDC DAAC	n/a	n/a	n/a
LaRC ASDC DAAC ftp	n/a	n/a	n/a
MODIS-LADSWEB	n/a	n/a	n/a
NSIDC DAAC	n/a	n/a	n/a
NSIDC DAAC ftp	11.5	11.4	9.2



Comments:

The echo node was moved at the end of September. Most ftp tests continued working (except from LaRC ASDC), but iperf tests need new firewall rules before resumption of testing. Iperf testing resumed from GES DISC in November, with excellent thruput.

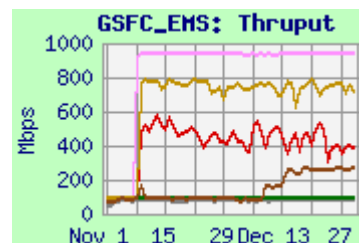
Ftp performance was stable from EROS and NSIDC, but initially dropped from GES DISC, then improved in late October with further reconfiguration. FTP performance is mostly limited by TCP window size – especially on ftps with long RTT.

2.3 GSFC-EMS: EOS Metrics System

Web Page: http://ensight.eos.nasa.gov/Organizations/gsfcs/GSFC_EMS.shtml

Test Results:

	Medians of daily tests (mbps)		
	Best	Median	Worst
EROS-PTH	85.9	77.5	17.3
ESDIS-PTH	938.3	936.9	924.1
GES DISC	579.5	426.2	202.8
LARC-PTH	94.0	94.0	20.7
MODAPS-PDR	869.4	741.4	475.9
NSIDC-SIDADS	286.2	253.8	190.2



Comments:

Testing is performed to GSFC-EMS from the above nodes, iperf only. The EMS testing from ESDIS-PTH, GES DISC, and MODAPS-PDR was transitioned to the new test node (FS1) in November, with much improved thruput. NSIDC-SIDADS was transitioned this month, also with improved thruput. Testing from LaRC and EROS transitioned in January. The performance limitation to the old server was its 100 mbps Fast-E connection; the new server is gigabit connected.

3) JPL:

3.1) GSFC → JPL:

Ratings: GSFC → JPL: Continued **Good**

Web Pages: http://ensight.eos.nasa.gov/Missions/aqua/JPL_AIRS.shtml
http://ensight.eos.nasa.gov/Missions/aura/JPL_MLS.shtml
http://ensight.eos.nasa.gov/Organizations/production/JPL_QSCAT.shtml
http://ensight.eos.nasa.gov/Organizations/production/JPL_PODAAC.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
GSFC-GES DISC → JPL-AIRS	220.3	180.1	114.4	31.8	182.4
GSFC-NISN → JPL-AIRS	201.9	188.4	167.8		
ESDIS-PTH → JPL-AIRS	242.0	199.2	145.2		
ESDIS-PTH → JPL-PODAAC	130.5	106.6	73.3		
MODAPS-PDR → JPL-PODAAC	77.4	57.9	32.4		
GSFC-NISN → JPL-QSCAT	85.4	73.8	66.9		
ESDIS-PS → JPL-QSCAT	90.2	74.1	40.5		
GSFC-NISN → JPL-MLS	309.8	235.5	147.6		
ESDIS-PTH → JPL-MLS	258.5	201.5	111.6		

Requirements:

Source → Dest	Date	Mbps	Rating
GSFC → JPL Combined	FY '08-'10	101.7	Good
GSFC → JPL AIRS	FY '08-'10	98	Good
GSFC → JPL PODAAC	FY '08-'11	1.5	Excellent
GSFC → JPL QSCAT	FY '08-'11	0.6	Excellent
GSFC → JPL MLS	FY '08-'10	2.1	Excellent

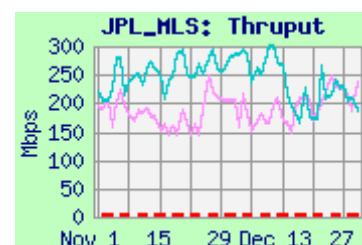
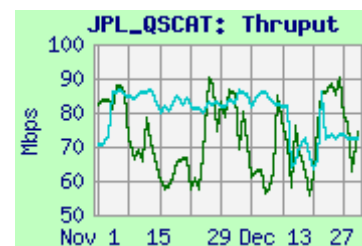
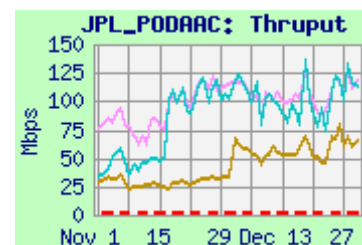
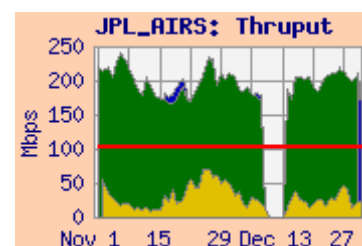
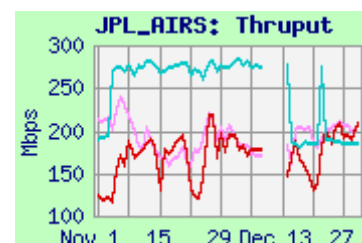
Comments: The user flow from GSFC/EOS to JPL combined was near normal this month.

AIRS, Overall: Integrated throughput from GES DISC remained well above 30% over the AIRS requirement, so the AIRS rating remains **Good**. The **JPL overall rating** is based on this test compared with the sum of all the GSFC to JPL requirements – the throughput is also remains above 1.3 x this requirement, so the overall rating also remains **Good**.

PODAAC: Testing to PODAAC was switched to the new node in May '11. Performance is somewhat lower than to the old node, but is still way above the 1.5 mbps PODAAC requirement, rating **Excellent**.

QSCAT: Thuput from ESDIS-PS (replacing ESDIS-PTH) to QSCAT is noisy but similar to GSFC-NISN which dropped a bit this month. It remains well above the modest requirement, rating **Excellent**.

MLS: Thuput from ESDIS-PTH was mostly stable. Thuput from GSFC-NISN was better until it dropped in mid December to about the same as ESDIS-PTH. The rating remains **Excellent**.



3.2) LaRC → JPLRating: Continued **Excellent**

Web Pages:

http://ensight.eos.nasa.gov/Organizations/production/JPL_TES.shtmlhttp://ensight.eos.nasa.gov/Missions/terra/JPL_MISR.shtmlhttp://ensight.eos.nasa.gov/Organizations/production/JPL_PTH.shtml**Test Results:**

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
LaRC DAAC → JPL-TES	495.5	417.4	181.3	0.12	417.4
LaRC PTH → JPL-TES	162.7	145.9	116.5		
LaRC PTH → JPL-TES sftp	3.08	3.07	3.02		
GSFC-NISN → JPL-TES sftp	3.17	3.14	3.09		
LaRC ANGE → JPL-PTH	77.5	74.7	68.1	3.9	74.7
LaRC PTH → JPL-PTH	65.7	46.5	27.0		
LaRC PTH → JPL-PTH sftp	31.8	31.8	31.8		
LaRC DAAC → JPL-MISR	59.2	55.4	42.2	0.61	55.4
LaRC PTH → JPL-MISR	60.4	56.9	38.9		

Requirements:

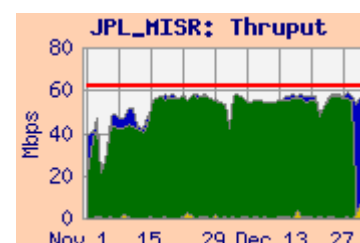
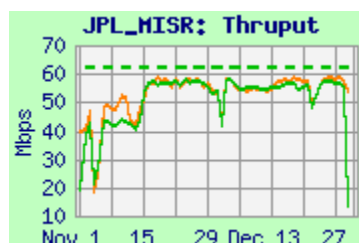
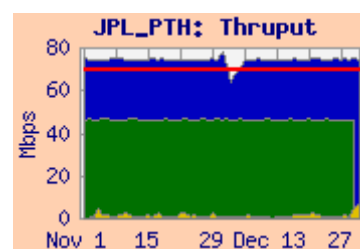
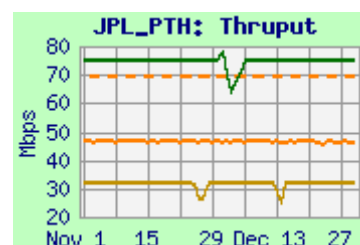
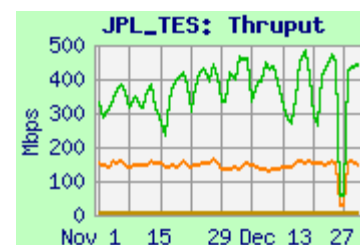
Source → Dest	Date	Mbps	Rating
LaRC DAAC → JPL-TES	FY '07 –	7.0	Excellent
LaRC DAAC → JPL-MISR	FY '07 –	62.3	Almost Adequate
LaRC → JPL-Combined	FY '07 –	69.3	Excellent

Note: The overall LaRC → JPL flow (3.9 mbps) was below last month's 9.7 mbps or October's exceptionally high 15.4 mbps. Only about 15% of the LaRC to JPL flow this month was for MISR (previously around 80%). The JPL-PTH integrated graph shows the overall LaRC to JPL user flow (vs. the overall requirement).

LaRC → JPL (Overall, TES): Median performance from LaRC ASDC DAAC to JPL-TES remains well over 3 x the TES and combined requirements, so the TES and Overall ratings remain "Excellent". User flow to TES is very low.

Sftp performance from LaRC-PTH to JPL-TES is quite low, apparently limited by the Sftp server on the TES node. An additional Sftp test to JPL-TES from GSFC-NISN (not graphed) gets similar poor results to LaRC-PTH. The Sftp window size on the new TES node is quite large, and is thus not the problem. Instead, it appears that the TES sftp application is throttling the sender. Note that Sftp results are much better from LaRC-PTH to JPL-PTH (than to TES), even though iperf results from the same source are better to TES than JPL-PTH.

LaRC → JPL (MISR): The MISR node was replaced in mid October – the throughput is lower than with the old node – will be retuned. It remains BELOW the new requirement, so the MISR rating remains "Almost Adequate". The average user flow to MISR was only about 1% of the new requirement.



3.3) JPL → LaRC**Rating: Continued Excellent**Web Page: http://ensight.eos.nasa.gov/Organizations/production/LARC_PTH.shtml**Test Results:**

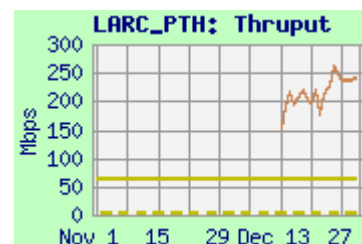
Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
JPL-PTH → LaRC PTH	63.0	62.7	62.6	0.4	62.7
JPL-TES → LaRC PTH	306.3	219.1	110.2		

Requirements:

Source → Dest	Date	Mbps	Rating
JPL → LaRC	FY '07 – '10	1.5	Excellent

Comment: This requirement is primarily for TES products produced at the TES SIPS at JPL, being returned to LaRC for archiving; it was reduced from 4.4 mbps in May '09 (and had been reduced in April '08 from 52.6 mbps). This month the thrupt from JPL-PTH was again stable at the lower of its two common states – 63 and 85 mbps. The rating remains “**Excellent**”. The small user flow was consistent with the requirement.

A new test was added this month from JPL-TES to LaRC-PTH, with much higher thrupt.

**4) GSFC → LaRC:****Rating: Continued Excellent**

Web Pages : <http://ensight.eos.nasa.gov/Organizations/production/LARC.shtml>
http://ensight.eos.nasa.gov/Organizations/production/LARC_ANGe.shtml
http://ensight.eos.nasa.gov/Organizations/production/LARC_PTH.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
GES DISC → LaRC ASDC	600.0	550.4	399.3	17.6	550.4
GSFC-EDOS → LaRC ASDC	779.8	358.9	87.9		
ESDIS-PTH → LaRC-ANGe	437.5	408.7	355.6		
GSFC-NISN → LaTIS	452.6	425.5	352.6		

Requirements:

Source → Dest	Date	Mbps	Rating
GSFC → LARC (Combined)	CY '09 – '11	31.3	Excellent

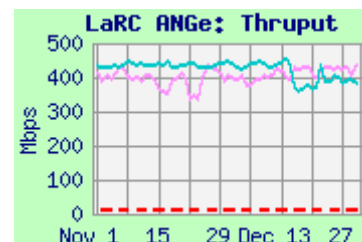
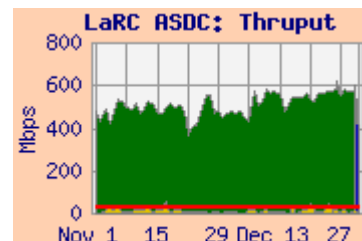
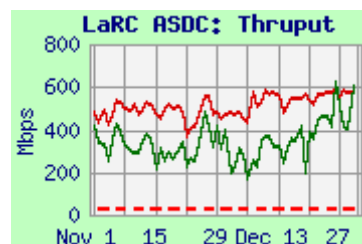
Comments:

GSFC → LaRC ASDC: The rating is based on the GES DISC to LaRC ASDC DAAC thrupt, compared to the combined requirement. It remains well above 3 x this requirement, so the rating remains “**Excellent**”.

Thrupt to ASDC from GSFC-EDOS was much lower than from GES DISC until it was retuned in mid August, with improved results.

As seen on the integrated graph, the user flow was variable, fairly consistent the requirement.

ANGe (LaTIS): Testing to ANGe from ESDIS-PTH gets steady performance. Testing to LaTIS (Darrin) from GSFC-NISN was similar, with very consistent results.



5) Boulder CO sites:

5.1) NSIDC:

Ratings: GSFC → NSIDC: Continued **Excellent**
 JPL → NSIDC: Continued **Excellent**
 GHRC → NSIDC: Continued **Excellent**

Web Pages: <http://ensight.eos.nasa.gov/Organizations/production/NSIDC.shtml>
http://ensight.eos.nasa.gov/Organizations/production/NSIDC_SIDADS.shtml
http://ensight.eos.nasa.gov/Organizations/production/NSIDC_PTH.shtml

The NSIDC DAAC was disconnected from NISN PIP in December '09 – all flows now go via the UCB campus, usually via FRGP to Internet2 or NLR. Thus the DAAC competes with the students for network capacity, and there was often significant diurnal variation.

The circuit from UCB to FRGP was increased from 1 gbps to 10 gbps on approx 10 July.

Test Results: NSIDC S4PA

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
GES-DISC → NSIDC DAAC	168.4	141.8	102.0	5.6	141.8
MODAPS-PDR → NSIDC DAAC	167.8	132.2	101.2		
GSFC-EDOS → NSIDC DAAC	124.3	54.4	13.6		
GSFC-ISIPS → NSIDC (iperf)	122.3	90.3	63.3		
JPL PODAAC → NSIDC DAAC	319.1	227.8	99.0		

Requirements:

Source → Dest	Date	Mbps	Rating
GSFC → NSIDC	CY '07 – '10	27.6	Excellent
JPL → NSIDC	CY '07 – '10	0.2	Excellent
GHRC → NSIDC	CY '07 – '10	0.5	Excellent

Comments: GSFC → NSIDC S4PA: This rating is based on testing from the **GES DISC** server to the NSIDC DAAC. The requirement was reduced in May '09 from 34.5 mbps (and was 64 mbps in April '08). Thruput from all GSFC sites to NSIDC improved in early December due to improved routing at FRGP

The integrated thuput from **GES DISC** remains above the requirement, by more than 3x, so the rating remains "**Excellent**".

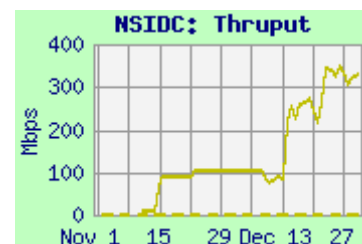
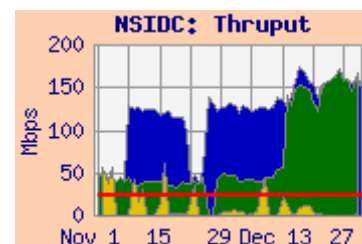
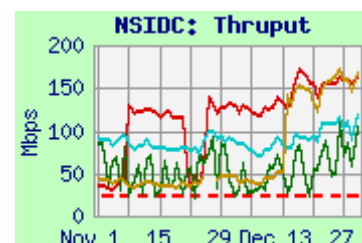
The user flow was about half of last month's 11.1 mbps, at about 20% of the reduced requirement.

Testing from **MODAPS-PDR** is now similar to **GES DISC**.

Performance from **EDOS**, and **ISIPS** also improved, but remains lower than **GES DISC**.

JPL PODAAC → NSIDC S4PA: The requirement was reduced from 1.34 mbps in May '09. Thruput from PODAAC to NSIDC has been mostly stable with a similar diurnal cycle since testing was moved to use Internet2 in September '09; the rating remains "**Excellent**".

Testing was discontinued when the PODAAC node was replaced in mid October, but was resumed in November, with improved performance after retuning. Performance improved further in December due to improved routing at FRGP.



5) Boulder CO sites (Continued):

5.1) NSIDC: (Continued): Test Results: GHRC to NSIDC

Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
GHRC → NSIDC DAAC (nuttcp)	21.9	11.3	4.4
GHRC → NSIDC DAAC (ftp pull)	34.6	12.5	2.2

GHRC, GHRC-ftp → NSIDC S4PA: GHRC (NSSTC, UAH, Huntsville, AL)

sends AMSR-E data to NSIDC via NLR / Internet2. The rating is based on reverse nuttcp testing. The median nuttcp throughput is more than 3x the 0.5 mbps requirement, so the rating remains “**Excellent**”.

Performance dropped in mid October (nuttcp: small drop, ftp: big drop), apparently due to switching routes at FRGP, and recovered in December.

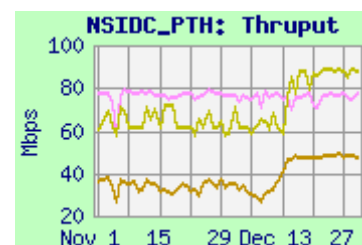
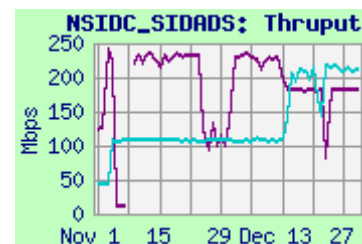
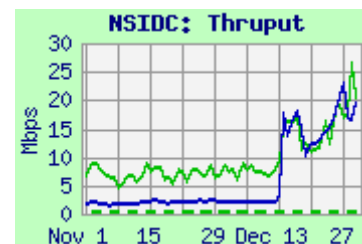
Test Results: NSIDC SIDADS, NSIDC-PTH

Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
GSFC-ENPL → NSIDC-SIDADS	191.0	183.2	153.5
GSFC-NISN → NSIDC-SIDADS	222.0	168.5	101.0
ESDIS-PTH → NSIDC-PTH	81.8	77.2	67.8
MODAPS-PDR → NSIDC-PTH	44.3	34.7	23.4
JPL PTH → NSIDC-PTH	81.7	61.5	41.4

GSFC → NSIDC-SIDADS: The FRGP route change in December improved performance to SIDADS via NISN but degraded performance from ENPL via Internet2.

NSIDC-PTH: Thruput to NSIDC-PTH from MODAPS-PDR and JPL PTH improved in mid December – due to switching routes at FRGP.

Performance from ESDIS-PTH was very steady.



5.2) NCAR:

Ratings: LaRC → NCAR: Continued **Excellent**

Web Pages <http://ensight.eos.nasa.gov/Missions/terra/NCAR.shtml>

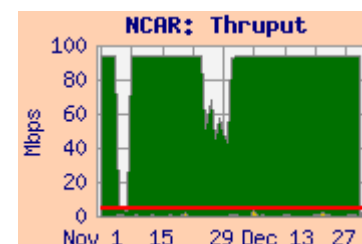
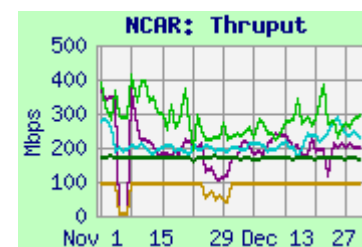
Test Results:

Source	Medians of daily tests (mbps)			Requirement
	Best	Median	Worst	
LaRC ASDC	451.4	268.6	184.2	0.1
LaRC PTH	181.3	170.3	132.9	
GSFC-ENPL-GE	286.9	201.5	120.4	n/a
GSFC-ENPL-FE	94.1	94.0	93.7	
GSFC-NISN	304.1	213.6	166.7	

Comments: NCAR has a SIPS for MOPITT (Terra, from LaRC), and has MOPITT and HIRDLS (Aura, from GSFC) QA requirements. NCAR is also connected to FRGP, but was not affected by the route changes which did affect NSIDC.

From LaRC: Thruput from LaRC ASDC was much less noisy (2.5:1 best : worst ratio, vs. 18:1 last September), and the median (also daily worst) remained well above 3 x the modest requirement, so the rating remains “**Excellent**”. Thruput from LaRC-PTH is lower but much steadier.

From GSFC: From GSFC-NISN, the route is via NISN to the MAX (similar route and performance as from LaRC). From GSFC-ENPL-GE, with a Gig-E interface, and a 10 gig connection to MAX, the median throughput was comparable. Performance from all sources is somewhat noisy but mostly stable. The average user flow from GSFC this month was 0.9 mbps, higher than most recent months.



5) Boulder CO sites (Continued):**5.3) LASP:**Ratings: GSFC ↔ LASP: Continued **Excellent**Web Page: <http://ensight.eos.nasa.gov/Organizations/production/LASP.shtml>**Test Results:**

Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
ESDIS-PTH → LASP blue (iperf)	9.08	9.00	8.33
ESDIS-PTH → LASP blue (scp)	3.76	3.66	3.19
LASP → GES DISC	9.34	9.34	8.71

Requirement:

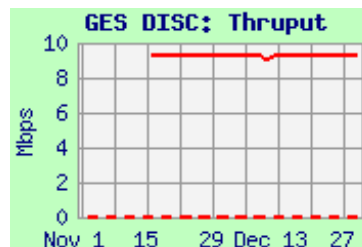
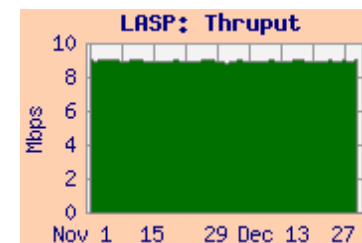
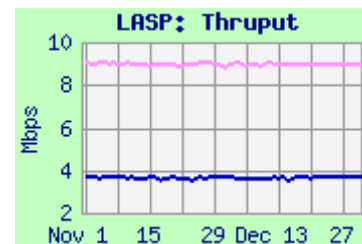
Source → Dest	Date	Mbps	Rating
LASP → GES DISC	CY '10 →	0.016	Excellent

Comments: In January '11, LASP's connection to NISN PIP was rerouted: it previously was 100 mbps from CU-ITS via NSIDC; this was changed to a 10 mbps connection to the NISN POP in Denver.

Thruput was very steady and consistent with the circuit limitation. Testing from EDOS was discontinued in September due to no longer having a requirement.

Testing was added in November from LASP and GES DISC as there is a requirement for the SORCE mission for this flow. Thruput from LASP to GES DISC was very stable, and well over 3x the requirement, so the rating remains "**Excellent**".

The average user flow from GSFC to LASP this month was above normal at 60 kbps. The flow from LASP to GSFC was quite steady, and averaged 0.27 kbps (0.00027 mbps), well below the requirement.

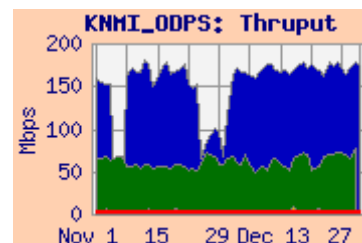
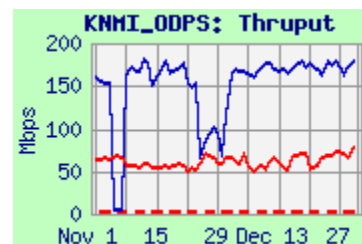
**6) KNMI:**Rating: Continued **Excellent**Web Pages http://ensight.eos.nasa.gov/Missions/aura/KNMI_ODPS.shtml**Test Results:**

Source → Dest	Medians of daily tests (mbps)			Reqmt
	Best	Median	Worst	
OMISIPS → KNMI-ODPS	85.9	65.5	41.3	0.03
GSFC-ENPL → KNMI-ODPS	197.4	170.4	141.5	

Comments: KNMI (DeBilt, Netherlands) is a SIPS and QA site for OMI (Aura). The route from GSFC is via MAX to Internet2, peering in DC with Géant's 10 gbps circuit to Frankfurt, then via Surfnets through Amsterdam.

The rating is based on the results from OMISIPS at GSFC to the ODPS primary server at KNMI. The thruput decreased in mid August, but remained much more than the tiny requirement, so the rating remains "**Excellent**". Thruput was higher from GSFC-ENPL (outside the ESDIS firewall).

The user flow averaged 3.2 mbps this month, (hard to see on the integrated graph). This is consistent with the previous 3.3 mbps requirement, but is much more than the current 0.03 mbps requirement (This new requirement remains under review). The rating would still be "**Excellent**" compared with the old 3.3 mbps requirement.



7) Remote Sensing Systems (RSS):

Ratings: JPL → RSS: Continued **Excellent**
 RSS → GHRC: Continued **Excellent**

Web Page <http://ensight.eos.nasa.gov/Missions/aqua/RSS.shtml>

Test Results:

Source → Dest	Medians of daily tests (mbps)			Req
	Best	Median	Worst	
JPL → RSS (NISN)	5.36	3.37	0.89	0.49
JPL → RSS (Comcast)	18.5	18.1	16.8	
RSS (Comcast) → GHRC (UAH)	4.62	3.81	3.05	0.34
RSS (Comcast) → GHRC (NISN)	4.25	3.57	2.78	

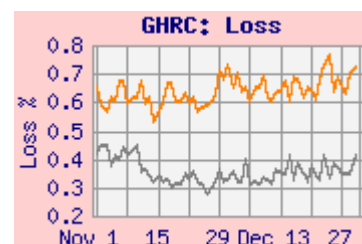
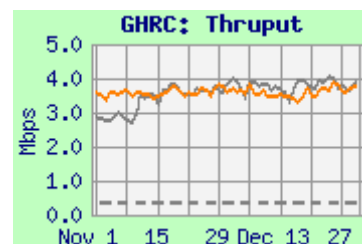
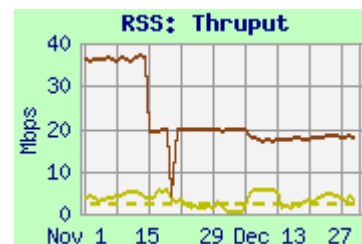
Comments: RSS (Santa Rosa, CA) is a SIPS for AMSR-E (Aqua), receiving L1 data from JAXA via JPL, and sending its processed L2 results to GHRC (aka NSSTC) (UAH, Huntsville, AL).

RSS currently is using a NISN SIP circuit: 4 x T1s to NASA ARC (total 6 mbps). The requirement was reduced with handbook 1.4.3 (was 2.5 mbps previously). The median iperf was more than 3 x the reduced requirement, so the rating remains "**Excellent**".

In April '11, a new Comcast circuit was installed, rated at 50 mbps incoming, and 12 mbps outgoing. Testing from JPL began on this circuit in April, with much better results, as shown above.

RSS → GHRC: In addition, the new server at RSS connected to the Comcast circuit allows "3rd party testing", as does the server at GHRC. Testing has therefore been initiated from RSS to GHRC, with results around 4 mbps, both to a UAH address and a NISN address at GHRC. Either result yields a rating of "**Excellent**" re the 0.34 mbps requirement.

Plans are being developed to switch the production flows to the Comcast circuit early in CY '12, leading to the removal of the T1s.



8) ERSDAC:

Ratings: **GSFC → ERSDAC:** Continued **Excellent**
ERSDAC → EROS: Continued **Excellent**
ERSDAC → JPL-ASTER-IST: Continued **Excellent**

Web Page: <http://ensight.eos.nasa.gov/Organizations/production/ERSDAC.shtml>

US ↔ ERSDAC Test Results

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
GSFC-EDOS → ERSDAC	95.6	74.2	8.7	3.67	75.0
GES DISC → ERSDAC	46.3	40.0	29.8		
GSFC ENPL (FE) → ERSDAC	82.9	79.6	79.3		
GSFC ENPL (GE) → ERSDAC	631.7	529.2	257.9		
ERSDAC → EROS	136.8	102.3	66.7	20.9	105.5
ERSDAC → JPL-ASTER IST	68.1	63.8	53.7		

Requirements:

Source → Dest	FY	Mbps	Rating
GSFC → ERSDAC	'05 - '09	5.4	Excellent
ERSDAC → JPL-ASTER IST	'07 - '09	0.31	Excellent
ERSDAC → EROS	'07 - '09	8.3	Excellent

Comments:

GSFC → ERSDAC: As of approximately 1 September '11, the ERSDAC test node is now connected at 1 gbps – formerly was 100 mbps. The median throughput from most nodes improved. A new test from GSFC ENPL was able to get average throughput over 500 mbps. However, some nodes have been using QoS (HTB) to reduce loss previously seen in the 1 gig to 100 meg switch at Tokyo-XP – those nodes remain limited by their HTB settings, and did not see much improvement.

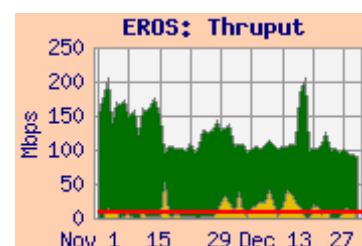
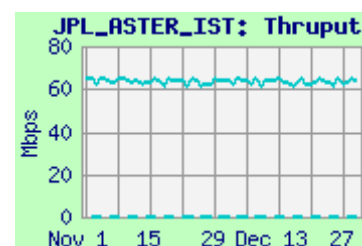
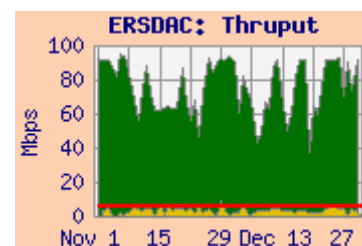
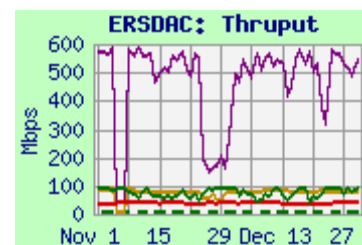
Performance from EDOS is now limited by HTB. Throughput remains well above 3 x the reduced requirement; the rating remains “Excellent”. The integrated chart shows that the user flow is stable, and consistent with the new requirement.

Throughput from GES DISC to ERSDAC did not improve. It had been thought to be limited by packet loss at the GigE to FastE switch at Tokyo-XP, but as that limitation has been eliminated, another culprit must be identified. It now seems likely that the problem is closer to GSFC, perhaps within EBnet – since GES DISC has high loss to several destinations. This configuration is planned to be upgraded soon.

The FastE connected GSFC-ENPL-FE node is limited to 100 mbps by its own interface, and gets steady throughput.

ERSDAC → JPL-ASTER-IST: The median throughput dropped a bit with the ERSDAC Gig-E upgrade (possibly due to a similar burst overload situation), but remains well above the [unstated] requirement (IST requirements are generally 311 kbps), so the rating remains “Excellent”.

ERSDAC → EROS: The throughput improved with retuning (again) in mid October, after the ERSDAC Gig-E upgrade; it remains well above the reduced requirement (was 26.8 mbps previously). The user flow was higher than normal this month. The median throughput is more than 3 x the reduced requirement, so the rating remains “Excellent”.



9) US \leftrightarrow JAXA

Ratings: **US \rightarrow JAXA:** Continued **Excellent**
JAXA \rightarrow US: Continued **Excellent**

The JAXA test hosts at EOC Hatoyama were retired on March 31, 2009 (the end of the Japanese government's fiscal year). No additional testing is planned for AMSR or TRMM. [All testing to JAXA-TKSC for ALOS was terminated at the end of June '09.](#)

However, the user flow between GSFC and JAXA continues to be measured. As shown below, the user flow this month averaged 2.65 mbps from GSFC to JAXA (with several peak periods above 5 mbps), and 79 kbps from JAXA to GSFC (with peaks above 300 kbps). Comparing these values to the new requirement of 0.1 mbps produces a rating of "**Excellent**" in both directions. Note that the user flow to JAXA is much more consistent with the old 2.0 mbps GSFC \rightarrow JAXA requirement.

